REMARKS

This response responds to the Office Action dated November 18, 2005 in which the Examiner rejected claims 1-5, 8-13 and 17-20 under 35 U.S.C. §103, objected to claims 6-7 as being dependent upon a rejected base claim but would be allowable if rewritten in independent form and stated that claims 15 and 16 are allowed.

Claim 1 claims an image data coding device, claim 8 claims an image forming apparatus, claim 9 claims an image data coding method and claim 13 claims a storage medium storing a program that can be operated on a processor to realize functions. The device, apparatus, method and program comprise a data converting unit and a coding unit. The data coding unit converts color data that is contained in image data into converted color data that corresponds to a difference from a reference color. The coding unit performs entropy coding on the converted color data in which the color data has been converted by the data converting unit.

Through the structure of the claims invention a) converting color data into data that corresponds to a difference from a reference color and b) performing entropy coding on the converted color data, as claimed in claims 1, 8, 9 and 13, the claimed invention provides a device, apparatus, method and program capable of preventing dramatic decreases in the compression ratio of the entropy coding when a balance of the color components is disturbed. The prior art does not show, teach or suggest the invention as claimed in claims 1, 8, 9 and 13.

Claims 1-5, 8-13 and 17-20 were rejected under 35 U.S.C. §103 as being unpatentable over *Darel et al.* (U.S. Patent No. 6,024,018) in view of *Katayama et al.* (U.S. Patent No. 5,909,505).

Applicant respectfully traverses the Examiner's rejection of the claims under 35 U.S.C. §103. The claims have been reviewed in light of the Office Action, and for reasons which will be set forth below, Applicant respectfully requests the Examiner withdraws the rejection to the claims and allows the claims to issue.

Darel et al. appears to disclose a system for monitoring and controlling color deviations during the startup and regular running phase of the printing process. (Col. 1, lines 5-7). A high-level flow diagram illustrating the test processing portion is shown in FIG. 10. The color monitoring performed during the running of the press is based on the comparison and analysis of the average properties of ROIs between the test and the reference image. First, the test image is acquired by the image acquisition unit (step 120). Next, the test image is aligned with the reference image acquired previously (step 122). The alignment procedure is necessary in order to obtain a meaningful comparison of ROI properties between the test and reference images since they were acquired at difference times. (Col. 10, lines 47-57). Following alignment of the test image, the test image is divided into a plurality of ink zones in accordance with the actual ink zones used in the press machine (step 124). Each ink zone is subsequently processed independently of all other ink zones using the method described herein. Assume that within each ink zone there are N ROIs, each containing Q pixels. The average R, G, B of each ROI in the RGB color space is then calculated (step 126). (Col. 11, lines 1-8). Color comparison is performed in the Lab color space and measured in units of ΔE. The average RGB of each ROI is then transformed into the Lab color space using transformation T1 which represents the color transformation from the RGB color space to the Lab color space (step 128). (Col. 11, lines 18-22). The difference ΔE for each ROI i can be expressed as

$$\Delta E_i = \sqrt{(DT_i - DR_i)^2}$$
$$= \sqrt{(L_\tau - L_R)^2 + (b_\tau - b_R)^2}$$

where DT_i and DR_i represent the average color vectors transformed into the Lab color space for the test and reference ROI i, respectively (step 130). The subscripts T and R represent the test and reference images, respectively. The ΔE_i of each ROI is then compared to a predetermined threshold which is modifiable and under user control (step 132). If every ΔE, is smaller than the threshold, it means no substantial color change occurred in the particular ink zone. Thus, the ink zone does not require processing. The method then continues with step 124 and the next ink zone is examined. Otherwise, an optimization algorithm is then applied to determine the appropriate change in CMYK, expressed as ΔCMYK, needed to restore the color back to its reference value. (Col. 11, lines 29-48)

Thus, *Darel* merely discloses at column 3, lines 35-59 and column 11, lines 39-48 and Figure 10 calculating a color difference between a test region of interest (ROI) and a predetermined threshold in order to determine if the printing ink within a ink zone needs to be restored back to its reference value. In other words, the average color vector of each region of interest is compared to a predetermined threshold to determine if the ink zone requires further processing. Nothing in *Darel et al.* shows, teaches or suggests converting color data into data that corresponds to a difference from a reference color as claimed in claims 1, 8, 9 and 13. Rather, *Darel* merely discloses comparing the average color vector of each ROI to a predetermined threshold to determine if further processing of the ink zone is required (i.e. the comparison in *Darel* is used to determine if the color needs to be restored and is not for converting color data into converted color data).

Additionally, once the average color vector for each ROI is compared, a determination is made whether the color needs to be restored back to its reference value. Nothing in *Darel et al.* shows, teaches or suggests performing entropy coding on the converted color data as claimed in claims 1, 8, 9 and 13. Rather, *Darel* merely discloses that once the comparison is made, a determination is made whether the ink zone requires further processing.

Katayama et al. appears to disclose an image encoding apparatus and an image decoding apparatus suitably used in a color copying machine, a color printer, a color facsimile apparatus, a database, or the like. (Col. 1, lines 13-17). FIGS. 11A and 11B are block diagrams showing the second embodiment. An image input device 210 inputs color image data in units of pixels. The apparatus of this embodiment also includes an RGB-YCrCb conversion unit 211, an edge emphasis unit 212, a frame memory 213, an edge detection unit 214, a black detection unit 215, a selector 216, a frame memory 217, an arithmetical encode unit 218, an achromatic color judgement unit 219, a frame memory 220, a black character elimination and average value substitution unit 221, a frame memory 222, an orthogonal conversion encode unit 223, and an encode data transmission unit 224. (Col. 11, lines 56-67). In the arithmetical encode unit 218, a black character pattern stored in the frame memory 217 is arithmetically encoded, and code data is output to the encode data transmission unit 224. In this embodiment, arithmetic encoding is used as a black character pattern encoding means. However, MH, MR, or MMR may be used in place of arithmetic encoding. (Col. 12, lines 51-57)

Thus, *Katayama* merely discloses an arithmetical encode unit 218 in which black character pattern, stored in a frame memory 217, is input and arithmetically

encoded. Nothing in *Katayama et al.* shows, teaches or suggests performing entropy coding on converted color data from a data converting unit as claimed in claims 1, 8, 9 and 13. Rather, *Katayama* merely discloses arithmetically encoding black character pattern, stored in a frame memory, in the arithmetical encode unit 218 (column 12, lines 51-54).

A combination of *Darel* and *Katayama et al.* would merely suggest to determine how to restore ink color in a region of interest as taught by *Darel et al.* while using an encoding unit 216 of *Katayama et al.* in order to arithmetically encode a black character pattern stored in a frame memory 217. Thus nothing in the combination of the references shows, teaches or suggests a) converting color data into converted color data that corresponds to a difference from a reference color and b) performing entropy encoding on the converted color data as claimed in claims 1, 8, 9 and 13. Therefore, Applicant respectfully requests the Examiner withdraws the rejection to claims 1, 8, 9 and 13 under 35 U.S.C. §103.

Claims 2-5, 10-12 and 17-20 depend from claim 1, 8-9 and 13 and recite additional features. Applicant respectfully submits that claims 2-5, 10-12 and 17-20 would not have been obvious within the meaning of 35 U.S.C. §103 at least for the reasons as set forth above. Therefore, Applicant respectfully requests the Examiner withdraws the rejection to claims 2-5, 10-12 and 17-20 under 35 U.S.C. §103.

Since objected to claims 6 and 7 depend from allowable claims, Applicant respectfully requests the Examiner withdraws the objection thereto.

Thus it now appears that the application is in condition for reconsideration and allowance. Reconsideration and allowance at an early date are respectfully requested. Should the Examiner find that the application is not now in condition for

allowance, Applicant respectfully requests the Examiner enters this Response for purpose of Appeal.

If for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is requested to contact, by telephone, the Applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed within the currently set shortened statutory period, Applicant respectfully petitions for an appropriate extension of time. The fees for such extension of time may be charged to our Deposit Account No. 02-4800.

In the event that any additional fees are due with this paper, please charge our Deposit Account No. 02-4800.

Respectfully submitted,

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